

CLAIMS

What is claimed is:

1. A method for generating an organic plug within a via, said via residing in an integrated circuit structure having a silicon containing dielectric material, said method

5 comprising:

firstly, applying an organic compound to said IC structure, said organic compound configured to occupy said via and a surface of said IC;

secondly, feeding a nitrous oxide (N_2O) gas into a reactor;

thirdly, generating a plasma in said reactor; and

10 fourthly, removing a portion of said organic compound so that said organic plug occupies said via.

2. The method of claim 1 wherein said organic compound is an antireflective coating (ARC).

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3. The method of claim 1 wherein said organic compound is a bottom antireflective coating (BARC).

4. The method of claim 1 further comprising generating a gas mixture by mixing a
20 diluent with said N_2O gas, and applying said gas mixture to said reactor.

5. The method of claim 4 wherein said diluent is a noble gas.

6. The method of claim 1 wherein said method for generating said organic plug is applied during one of a plurality of steps performed during a dual damascene process.

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7. The method of claim 1 wherein said silicon containing dielectric material is selected from a group consisting of organosilicate glass (OSG), silicon dioxide (SiO₂), and fluorinated silicate glass (FSG).

10 8. A method for generating an organic plug within a via, said via residing in an integrated circuit structure having a first photoresist layer, a second intermediate layer, and a third silicon containing dielectric layer, said method comprising:

firstly, applying an organic compound to said IC structure, said organic compound configured to occupy said via and a surface of said IC;

15 secondly, feeding a nitrous oxide (N₂O) gas into a reactor;

thirdly, generating a plasma in said reactor; and

fourthly, removing a portion of said organic compound to generate said organic plug within said via.

20 9. The method of claim 8 wherein said organic compound is an antireflective coating (ARC).

10. The method of claim 8 wherein said organic compound is a bottom antireflective coating (BARC).

11. The method of claim 8 further comprising generating a gas mixture by mixing a
5 diluent with said N_2O gas, and applying said gas mixture to said reactor.

12. The method of claim 11 wherein said diluent is a noble gas.

13. The method of claim 8 wherein said method for generating said organic plug is
10 applied during one of a plurality of steps performed during a dual damascene process.

14. The method of claim 8 wherein said silicon containing dielectric material is selected from a group consisting of organosilicate glass (OSG), silicon dioxide (SiO_2), and fluorinated silicate glass (FSG).

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15. A method for generating an organic plug within a via, said via residing in an integrated circuit structure having a first photoresist layer, a second intermediate layer, and a third silicon containing dielectric layer, said method comprising:

firstly, applying an organic compound to said IC structure wherein said organic
5 compound is a bottom antireflecting coating (BARC), said organic compound configured to occupy said via and a surface of said IC;

secondly, feeding a nitrous oxide (N_2O) gas into a reactor;

thirdly, generating a plasma in said reactor; and

fourthly, removing a portion of said organic compound to generate said organic
10 plug within said via.

16. The method of claim 16 further comprising generating a gas mixture by mixing a diluent with said N_2O gas, and applying said gas mixture to said reactor.

15 17. The method of claim 16 wherein said diluent is a noble gas.

18. The method of claim 16 wherein said silicon containing dielectric material is selected from a group consisting of organosilicate glass (OSG), silicon dioxide (SiO_2), and fluorinated silicate glass (FSG).

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19. The method of claim 18 wherein said method for generating said organic plug is applied during one of a plurality of steps performed during a dual damascene process.